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ABSTRACT

Oregon-Washington Carpenters/Employers Apprenticeship and Training Trust, the United Brotherhood of Carpenters and Joiners Local 247, and Associated General Contractors cooperated with Mt. Hood Community College (Oregon) in a workplace literacy program. A drop-in learning center was operated at the Carpenter Training Center to provide support in mathematics to apprentices participating in intensive 1-week construction trade courses. Preapprentices were tested and provided with evening one-on-one tutorial assistance in math as requested. Customized mathematics instructional materials were developed for use in conjunction with job tasks requiring blueprints, calculator use, algebra, geometry, and specific measurement conversions. Student attendance at the center was voluntary and varied from 1 to 6 hours. (The four-page report is followed by supplementary project materials. Appendix I outlines objectives, methods, and evaluation criteria. It also provides information relating to the needs assessment. Appendix II contains summary data on learners. Completed post-program participant survey sheets are provided in Appendix III. Appendix IV contains instructional materials, including quizzes, worksheets, pretests/posttests, and revised instructor materials. Additional post-program participant survey sheets are presented in appendix V.) (YLB)

ED346257

THE COLUMBIA-WILLAMETTE SKILL BUILDERS CONSORTIUM

National Workplace Literacy Program (84.198)
U.S. Department of Education

FINAL PERFORMANCE REPORT

Submitted by
Portland Community College
12000 S.W. 49th Avenue
Portland, Oregon 97219

APPENDIX V. Instructors' Reports and Sample Curriculum Materials

B. Mt. Hood Community College/
Oregon Washington Carpenters Employers
Apprenticeship & Training Trust Fund:

Carpenter Apprentice Program -
Marjorie Taylor, Sandra Clawson, Scott Copeland,
Merry Jo Chatelain, and Wayne Werbel

Shop Math

CE 061 259

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I **Initial contact and identification of needs:**

At a general interest meeting held at the Northwest Oregon Labor Council concerning Workplace Literacy, representatives of the International Brotherhood of Carpenters and Joiners and the Willamette Training Center (Carpenter Apprentice Program) identified basic mathematics as an area of intense concern. Two areas of emphasis were identified:

a) limited mathematics skills among pre-apprentices.

b) varied level of essential mathematics understanding of carpenters in stages of the apprentice program was substandard.

Everyone agreed the carpentry work was becoming more technical with all workers required to read specifications or blueprints.

Individual meetings with union officials and group meetings with carpentry instructors identified methods to interface Skill Builder instruction with on-going apprentice and pre-apprentice training. Labor representatives participated in the recruitment, interviewing and selection of instructors.

II. **Collaboration to set up classes:**

In coordination with the Carpenter's Apprenticeship program, it was recognized that the union training trust was the lead agency in determining needs and developing basic skills instruction intervention strategies. The college's ability to be flexible and adaptable enabled the development of a service that complimented existing training.

a. Entry into job site:

The Carpenters Training Trust determined which jobs to focus on, emphasizing a need for both pre-apprentices and apprentices. A review of existing carpenter training materials and interviews with current carpenter trust instructors and administrators identified initial needs (see Section III for a detailed explanation and supporting materials). During carpenter apprentice training activities, individuals were referred to the learning center as needed (i.e. math-based problem required intensive assistance). Pre-apprentices were tested during training and referred to evening tutorial if they wanted individual assistance. Participation was voluntary and appreciated. There were many returning students over the year.

b. Logistical considerations

The Carpenter Training Center offered one week intensive apprentice training required four times per year. The apprentices are involved in a six-year program leading to journeyman status. A learning center at the Carpenter Training Center was established, open two days per

week for three hours in each day. Securing a workable space for the learning center required patience and continued efforts with training center management. The learning center was a private room, small but comfortable, and accessible year round. The learning center enabled carpenters to receive tutoring on an as-needed basis. Recruitment was aided by participation of the labor liaison at the pre-apprentice training classes. Interested individuals, after taking a math test, were referred to individualized tutoring. The apprentices were best recruited by word of mouth from one to another by their personal experiences receiving tutoring and affirmation of Skill Builders services from their carpentry instructors. The projected results from initial proposal plan to serve (35), to actual participation (203), has shown a 500% increase in unduplicated headcount as of October 15, 1991, with services anticipated to be offered through March, 1992.

III. Determination of curriculum content and development of curriculum:

- Nature and sources: Visits to site, interviews with instructors.
- How objectives were identified: Needs of instructors.
- How job materials, technologies, tasks/activities were incorporated into curriculum: We redid many of the worksheets already in use. We developed new ones to cover additional needs. (See **Appendix IV Revised Instructor Materials** and **Worksheets, Handouts and Forms.**) Calculators were encouraged so much of our emphasis was on correct calculator use.
- Problems in the process: The major problem initially was having materials revised and available when the students came to us. Each week students came with different needs for which we were unable initially to be prepared. Six months into the project we felt prepared for just about any need of the students.
- Solutions: Students or instructors were available to help us in tight situations.

IV. Delivery of instruction:

- Participants: See **Appendix II, Learner Data Forms**

- Factors affecting participation: It was primarily voluntary participation. Pre-Apprentice and Apprentice carpenters came in for special math review or help when they were unable to perform the required apprenticeship mathematics. They attend apprenticeship classes for a week at a time, four times a year. Six hours of that week two instructors are available for mathematics lab. Prior to joining the program, they attend a pre-apprenticeship orientation. We are also available for several hours of the orientation.

V. Assessment of Learners:

Initial assessment tools were lengthy sets of fraction problems. These were used by the Center's instructors. We found that not everyone needed fraction practice. See for the variety of pre- and post-tests that were eventually developed. Results are given on Learner Data Forms.

VI. Program Evaluation:

Formative: Feedback was given through the enthusiasm of the Center's instructors and their continued efforts to encourage their students to postpone projects to attend the math lab. There was continuous development of materials to meet the needs of each student. The primary change occurred with the development of Pre/Post-tests mentioned previously. Occasionally, we provided instruction for the entire apprentice class. It was generally on fraction-decimal conversions and right triangle formulas.

Summative: The measurement tools were based on the particular needs of each student. Generally each week there were different needs ranging from fractions to volume to right triangle calculations.

The learners repeatedly reported success in the math used in the apprenticeship classes after attending our labs or classes. We also experienced a high rate of return students for those whose math skills had been weak when they entered the apprenticeship program.

Many students reported increased confidence when they were preparing for the Journeyman's examination.

VII. Overall issues, concerns, comments:

A concern that was almost immediately resolved was in determining a room at the training center where we could offer not only instruction, but also store all of our materials. Initially we gathered wherever an available room could be found, while our materials were sometimes in a different room,often occupied by another person or class. Finally it was agreed that we could locate our instruction and materials in a seldom used lounge. This has been a perfect set-up.

The cooperation and facilities provided to us are to be commended. We have always felt welcomed by the staff through their encouragement and willingness to meet our needs.

- Estimate of number of hours spent in:

Hours	Activity
44	Negotiation and planning with partner
18	Planning with other consortium members
304	Curriculum development
434	Actual instruction (available 14 hours per week)
131	Recordkeeping and write-up

Since October, 1990 there have been 14 hours/week scheduled for instruction. Some of that time was also used for curriculum development and revision, recordkeeping and write-up when student load was light.

APPENDIX I:

OVERVIEW ◦

OBJECTIVES ◦ METHODS ◦
EVALUATION
OVERVIEW

NEEDS ASSESSMENT

STAFF REPORT OF
PARTICIPANT'S
FEEDBACK

Name: Sandy Clawson/Margie Taylor

Partnership:

Mt. Hood Community College
Oregon-Washington Carpenters/Employers Apprenticeship and Training Trust
United Brotherhood of Carpenters and Joiners of America, Local Union #247
Associated General Contractors

Techniques Used to Target/Assess Instructional Needs:

Audits and task analysis with Garry Goodwin, Tom Day, Jim Murphy, Ron Hanson, Harold Brainstetter, and clients.

Assessment and evaluation of diagnostic tools currently used in training.

Instructional Goals:

1. Improved competencies in mathematics and reading; specifically calculator use, algebra and reading blueprints.
2. Improved job performance and greater promotability.
3. Provide basic skills instruction for apprenticeship program.

Status & Timeline For Curriculum Development:

We have been in the process of selecting commercial materials, developing materials, field testing and revising curriculum since August 1, 1990. Focus has been on job-specific tasks, calculation in construction and algebra.

BUILDING TRADES LAB

OBJECTIVES	METHODS/ACTIVITIES	EVALUATION CRITERIA
The student will:	Pre-tests	Post tests
Decode basic written vocabulary accurately	One-on-one tutoring	Instructor interview
Perform multi-step geometric computations	Oral drills	Application of skill to workplace project
Acquire calculator applications as needed in the workplace	Cooperative learning	Job performance
Apply formulas to work-related problems	Group instruction	
Demonstrate estimating skills	Application of formulas	
Interpret and solve functional context related computations	Application of calculator functions	
Follow written instructions	Transfer word problems to numerical problems	

Contractor Advisory Team - they designed this

Needs Assessment: Carpenters

1. We are planning on attending the job entry training. What role, if any, do you want us to play? Are there certain parts that you want us there for do you think the entire session would benefit us? (What should we wear?)

   intro to group

2. When do the applicants/apprentices take the Pre-Apprenticeship Evaluation Test?

   37 comp pre math sys.

3. Do they have 1/2 an hour to do it? Or is it the Math Exam that must be done in 1/2 an hour? Need final Math Exam - 2 hrs on training Thurs

4. Can we see the exams to diagnose where the most difficulty for the students appears to be? If so, when?_____

5. Did you get the math program from your friend? Len - St. Louis

6. Can we get a good copy of the skill blocks? Wayne

7. The grant mentions that our instruction should include blueprint reading, calculator use, reading contract documents and specifications, algebra in construction, and safety. Do you see these as your most basic needs?
   Blue print_____ Calculator X Documents_____Algebra_____

   Safety_____

8. Which skill blocks specifically address these areas? Blueprint_____

   Calculator X Documents_____Algebra_____

   Safety X

9. Or do we need to address even more basic skills such as multiplication, division, per cent, etc., reading?_____

   _____

10. We are feeling that any math program would be most beneficial during training, perhaps an hour before training begins in the morning, or 1/2 hour at lunchtime. How do you feel about this?_____

Saturday - intro as to who we are - 7:30 - 3:00

MEMO

To: Supervisors and Shop Stewards

From: The Skill Builders - a voluntary no cost program funded by the U. S. Dept. of Education.

Subject: Training Course

Purpose: The purpose of the questionaire is to help us in determining the specific math and reading skills your workers need to improve their effectiveness on the job.

Description of Course: Calculation in construction is a weekly class for apprentices and pre-apprentices aimed to sharpen math skills. It is available for one to four hours.

revised The Skill Builder series includes the following: 1) bluprint reading, 2) calculator use, 3) reading contract documents and specifications, 4) algebra in construction, and 5) safety.

Directions: Please describe your workers' needs as completely as you can. Most of the answers require a yes/no answer or a short phrase. Please return the survey by August 6, 1990 in the enclosed envelope.

1. Will this course meet a need or benefit your workers? Yes_____ No_____

2. How many workers would benefit from this training? _____

3. How many workers would be interested in this training? _____

4. How many workers would participate? _____

5. What areas should be emphasized?

---

6. Are there any special ~~problems~~ needs? (ESL)

Thank you for taking the time to answer the survey. We will let you know the results.

GED!

APPENDIX II

LEARNER'S DATA FORMS

Skill Builders Learner Data

Social Security Number _____ Term _____ Year _____

Last Name _____ First Name _____ I. _____

Address _____ City/State _____ Zip _____

County _____ Day Phone _____ Sex _____ Birthdate _____

High School last attended _____ State _____ Yr of Grad or GED _____

Please circle your response to the following four questions:

Duration - time in attendance planned at MHCC
1. 1 Quarter only
2. 2 Quarters
3. 1 Year
4. 2 Years
5. 3 Years
6. More than 3 Years

Employed
F Full time (35+ hrs/week)
P Part time (5-34 hrs/week)
N Not employed

Ethnic Data
1. American Indian
2. Black Afro-American
3. Caucasian White
4. Oriental Asian
5. Spanish Surnamed American (Hispanic Chicano)
6. Non U.S. Citizen

Educational Level
1. Less than High School
2. GED Certificate
3. High School Diploma
4. 2 Yrs College - no degree earned
5. 3 Yrs College or more - no degree earned
6. Certificate
7. AA Degree
8. Bachelors
9. Masters or PhD

Ultimate Motive
1. To get a job
2. To enhance my current job
3. To get a better job
4. Personal enrichment
5. To explore a career direction
6. Other

Educational Goal
1. To take one class
2. To take a few classes
3. To earn a 2-year degree
4. To earn a 1-year certificate
5. To earn a GED certificate
6. To earn a 4-year degree
7. Other

Course#	Section	Course Name	Attendance	Prev Adult Ed

Employment Information:

Position Title _____ Yrs with company _____ Yrs in present position _____

Partner _____

Assessment:

Screening	Pre Test	Post Test

SKILL BUILDERS LEARNER DATA
DATA SUMMARY/ALL TERMS

PROGRAM: Carpenters

TOTAL STUDENTS SERVED: 307 **Male:** 291 **Female:** 16

BIRTHDATE:

	Male/Female
1942	1/0
1943	1/0
1944	1/0
1946	2/0
1947	2/0
1948	2/0
1949	2/0
1950	6/0
1951	2/1
1952	6/0
1953	4/2
1954	10/1
1955	11/0
1956	10/1
1957	7/0
1958	6/1
1959	10/1
1960	18/1
1961	9/3
1962	23/0
1963	15/1
1964	17/0
1965	15/0
1966	13/1
1967	10/0
1968	17/0
1969	10/1
1970	9/0
1971	11/0
1972	7/0
1973	3/0

ETHNICITY:

	Male/Female
Am Indian	8/3
Black Afro-Am	8/0
Caucasian	233/13
Sp Surnamed Am	5/0

EMPLOYED:

	Male/Female
Not Employed	22/0
Part-Time	8/0
Full-Time	28/0

PRE AND POST TEST SCORES

Average increase in scores is 134%

EDUCATIONAL LEVEL

	Male/Female		Male/Female
Less than high school	22/1	3 Yrs Coll/No Degree	4/0
GED Certificate	37/1	Certificate	2/0
High School Diploma	154/11		
2 Yr College/No Degree	2/0		

ULTIMATE MOTIVE

	Male/Female
To get a job	13/0
To enhance current job	19/0
To get better job	15/0
Personal Enrichment	1/0
To explore career direction	12/0
Other	2/0

EDUCATIONAL GOAL

	Male/Female
To take one Class	209/11
To take a few classes	3/0
To earn a 2-yr degree	5/0

SKILL BUILDERS LEARNER DATA
DATA SUMMARY

PROGRAM Carpenters **TERM** Fall **YEAR** 1990

STUDENTS SERVED: 27 **MALE:** 26 **FEMALE:** 1

BIRTHDATE:

	Male	Female
1930		
1931		
1932		
1933		
1934		
1935		
1936		
1937		
1938		
1939		
1940		
1941		
1942		
1943		
1944		
1945		
1946		
1947		
1948		
1949		
1950		
1951		
1952		
1953		1
1954	1	
1955	1	
1956		
1957	1	
1958		
1959	1	
1960	1	
1961	1	
1962	3	
1963		
1964		
1965	2	
1966	2	
1967		
1968	4	
1969	4	
1970	1	
1971	2	
1972		
1973		
1974		
1975		
1976		

ETHNICITY:

	Male	Female
1		
2	2	
3	9	1
4		
5		
6		

EMPLOYED

	Male	Female
Not	N/R	N/R
Part		
Full		

EDUCATIONAL LEVEL

	Male/Female
1	1/NR
2	
3	1/
4	
5	
6	
7	

ULTIMATE MOTIVE

	Male/Female
1	NR/NR
2	
3	
4	
5	
6	

EDUCATIONAL GOAL

	Male/Female
1	26/1
2	
3	
4	
5	
6	
7	

PRE AND POST TEST SCORES:

% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST

No Pre/Post Test Scores

SKILL BUILDERS LEARNER DATA
DATA SUMMARY

PROGRAM Carpenters **TERM** Winter **YEAR** 1991

STUDENTS SERVED: 46 **MALE:** 44 **FEMALE:** 2

BIRTHDATE:

	Male	Female
1930		
1931		
1932		
1933		
1934		
1935		
1936		
1937		
1938		
1939		
1940		
1941		
1942		
1943	1	
1944	1	
1945		
1946		
1947		
1948		
1949		
1950	1	
1951	1	
1952		
1953		1
1954	2	
1955	1	
1956	1	
1957	1	
1958	2	
1959	4	
1960	2	
1961	1	
1962	3	
1963	4	
1964	1	
1965		
1966	3	
1967	1	
1968		
1969		
1970		
1971		
1972	1	
1973		
1974		
1975		
1976		

ETHNICITY:

	Male	Female
1	3	1
2	4	
3	31	1
4	1	
5		
6		

EMPLOYED

	Male	Female
Not	N/R	N/R
Part		
Full		

EDUCATIONAL LEVEL Male/Female

1
2
3 28/2
4
5
6
7

ULTIMATE MOTIVE Male/Female

1 N/R N/R
2
3
4
5
6

EDUCATIONAL GOAL Male/Female

1 44/2
2
3
4
5
6
7

PRE AND POST TEST SCORES:

% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST
37/68	0/100	74/82	20/100	
0/100	0/100	0/100	20/88	
93/-	73/93	40/100		
0/100	22/77	50/-		
50/50	0/100	33/88		
95/-	0/100	6/50		

SKILL BUILDERS LEARNER DATA
DATA SUMMARY

PROGRAM Carpenters **TERM** Spring **YEAR** 1991

STUDENTS SERVED: 80 **MALE:** 76 **FEMALE:** 4

BIRTHDATE:

	Male	Female
1930		
1931		
1932		
1933		
1934		
1935		
1936		
1937		
1938		
1939		
1940		
1941		
1942	1	
1943		
1944		
1945		
1946		
1947	1	
1948	2	
1949	1	
1950	1	
1951	1	
1952	4	
1953	1	
1954	4	
1955	4	
1956	1	
1957	3	
1958	3	
1959		1
1960	7	
1961	3	1
1962	4	
1963	3	1
1964	9	
1965	4	
1966	2	
1967	2	
1968	5	
1969	1	1
1970	4	
1971	3	
1972	1	
1973		
1974		
1975		
1976		

ETHNICITY:

	Male	Female
1	5	
2	2	
3	51	4
4	3	
5		
6		

EMPLOYED

	Male	Female
Not	2	N/R
Part	3	
Full	9	

EDUCATIONAL LEVEL

	Male/Female
1	8/1
2	9
3	39/2
4	
5	
6	
7	

ULTIMATE MOTIVE

	Male/Female
1	3/
2	6/
3	5/
4	
5	2/
6	1/

EDUCATIONAL GOAL

	Male/Female
1	6/
2	2/
3	
4	3/
5	
6	
7	

PRE AND POST TEST SCORES:

% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST
7/20	70/80	20/90	30/67	73/80
70/90	70/80	50/70	50/100	70/80
40/100	30/100	13/100	100/100	20/100
60/90	70/80	80/100	60/100	-/80
70/50	40/70	67/100	14/40	90/100
90/100	67/100	27/87	80/100	0/83
80/100	27/80	60/100	10/100	73/100
70/90	70/80	70/80	0/90	70/80
-/80	70/80	70/-	83/75	80/-
27/100	0/80	100/100	37/100	60/100
60/80	10/80	70/80	50/80	67/100

%PRE/%POST	Reverse side of Carpenters Spring 1991
100/100	
50/-	
27/60	
0/90	
20/80	
0/86	
73/100	
25/50	
70/80	
0/80	
13/73	
20/90	
10/80	
70/80	
35/100	
0/100	
70/90	
73/100	

SKILL BUILDERS LEARNER DATA
DATA SUMMARY

PROGRAM Carpenters **TERM** Summer **YEAR** 1991

STUDENTS SERVED: 49 **MALE:** 44 **FEMALE:** 5

BIRTHDATE:

	Male	Female
1930		
1931		
1932		
1933		
1934		
1935		
1936		
1937		
1938		
1939		
1940		
1941		
1942		
1943		
1944		
1945		
1946		
1947		
1948		
1949		
1950	1	
1951		
1952	1	
1953	1	
1954	2	
1955	2	
1956	2	
1957	1	
1958	1	1
1959	3	
1960	1	1
1961	1	2
1962	3	
1963	3	
1964	1	
1965	2	
1966	1	
1967	3	
1968	3	
1969	1	
1970	6	1
1971	2	
1972		
1973		
1974		
1975		
1976		

ETHNICITY:

	Male	Female
1		
2		
3	43	5
4		
5	1	
6		

EMPLOYED

	Male	Female
Not	1	N/R
Part	1	
Full	6	

EDUCATIONAL LEVEL

	Male/Female
1	2/
2	7/1
3	33/4
4	
5	
6	
7	

ULTIMATE MOTIVE

	Male/Female
1	
2	6/
3	
4	
5	2/
6	

EDUCATIONAL GOAL

	Male/Female
1	34/4
2	1/
3	
4	2/
5	
6	
7	

PRE AND POST TEST SCORES:

% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST
0/100	56/-	50/80	0/100	30/100
87.5/100	60/100	0/100	60/100	50/100
33/100	33/100	0/100	0/100	70/100
67/87.5	70/100	20/90	-/93	20/100
-/100	0/100	0/100	10/90	-/100
75/100	5/80	70/100	10/50	0/50
50/100	60/80	50/100	-/100	67/100
40/100	0/100	0/100	0/100	20/100
75/100	50/80	60/100	20/60	0/100
		50/90	62/100	

SKILL BUILDERS LEARNER DATA
DATA SUMMARY

PROGRAM Carpenters **TERM** Fall **YEAR** 1991

STUDENTS SERVED: 79 **MALE:** 75 **FEMALE:** 2

BIRTHDATE:

	Male	Female
1930		
1931		
1932		
1933		
1934		
1935		
1936		
1937		
1938		
1939		
1940		
1941		
1942		
1943		
1944		
1945		
1946	2	
1947	1	
1948		
1949	1	
1950	3	
1951		1
1952	1	
1953	1	
1954	1	
1955	2	
1956	5	
1957	1	
1958		
1959	1	
1960	4	
1961	1	
1962	6	
1963	4	
1964	5	
1965	5	
1966	5	
1967	3	
1968	5	
1969	3	
1970	2	
1971	6	
1972	4	
1973	2	
1974		
1975		
1976		

ETHNICITY:

	Male	Female
1		2
2		
3	75	
4		
5		
6		

EMPLOYED

	Male	Female
Not	14	
Part	3	
Full	10	

EDUCATIONAL LEVEL

	Male/Female
1	10/ N/R
2	16/
3	38/2
4	1/
5	1/
6	1/
7	

ULTIMATE MOTIVE

	Male/Female
1	9/ N/R
2	6/
3	7/
4	
5	5/
6	

EDUCATIONAL GOAL

	Male/Female
1	75/2
2	
3	
4	
5	
6	
7	

PRE AND POST TEST SCORES:

% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST
0/100	0/95	0/80	0/80	
0/80	0/100	0/100	0/100	
0/-	0/80	0/89		
0/80	0/60	66/88		
0/100	0/100	25/89		
0/89	0/100	0/100		
0/80	0/100	0/90		
20/100	0/60	0/90		
37.5/89	0/80	67/100		
0/100	0/80	0/77		

SKILL BUILDERS LEARNER DATA
DATA SUMMARY

PROGRAM Carpenters **TERM** Winter **YEAR** 1992

STUDENTS SERVED: 26 (to date) **MALE:** 24 **FEMALE:** 2

BIRTHDATE:

	Male	Female
1930		
1931		
1932		
1933		
1934		
1935		
1936		
1937		

	Male	Female
1938		
1939		
1940		
1941		
1942		
1943		
1944		
1945		

	Male	Female
1946		
1947		
1948		
1949		
1950		
1951		
1952		
1953	1	

	Male	Female
1954		
1955	1	
1956	1	1
1957		
1958		
1959	1	
1960	3	
1961	2	

	Male	Female
1962	4	
1963	1	
1964	1	
1965	2	
1966		1
1967	1	
1968	1	
1969	1	

	Male	Female
1970	2	
1971		
1972	1	
1973	1	
1974		
1975		
1976		

ETHNICITY:

	Male	Female
1		
2		
3	24	2
4		
5		
6		

EMPLOYED

	Male	Female
Not	5	N/R
Part	1	
Full	3	

EDUCATIONAL LEVEL

	Male/Female
1	1/
2	5/1
3	15/1
4	1/
5	1/
6	
7	

ULTIMATE MOTIVE

	Male/Female
1	1/ N/R
2	1/
3	2/
4	1/
5	3/
6	1/

EDUCATIONAL GOAL

	Male/Female
1	24/2
2	
3	
4	
5	
6	
7	

PRE AND POST TEST SCORES:

% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST	% PRE/% POST

PRE and POST Test scores to follow

APPENDIX III

POST PROGRAM PARTICIPANT SURVEY SHEETS

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?

JUST ABOUT EVERYTHING

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?

X Yes ____ No Why or why not? _____

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	(4)	3	2	1	Totally useless to me outside work
Exactly what I expected	5	(4)	3	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	5	(4)	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ____ No

Why or why not? _____

6. If you could change anything about this program, what would it be? NOTHING

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
FRACTIONS

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?

X Yes ____ No Why or why not? _____

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program?						
Very interesting to me	5	(4)	3	2	1	Boring to me
Very useful to me on the job	5	(4)	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	4	(3)	2	1	Totally useless to me outside work
Exactly what I expected	5	4	(3)	2	1	Not at all what I expected
How would you rate the materials?						
Easy to learn and simple for me	(5)	4	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ____ No

Why or why not? _____

6. If you could change anything about this program, what would it be? NOTHING

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
fraction and review area and volume

2. How many classes have you attended so far? 3 Classes

3. Has this class helped you meet or work toward any of your personal goals?

X Yes ____ No Why or why not? _____

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program?						
Very interesting to me	5	(4)	3	2	1	Boring to me
Very useful to me on the job	5	(4)	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	4	(3)	2	1	Totally useless to me outside work
Exactly what I expected	5	(4)	3	2	1	Not at all what I expected
How would you rate the materials?						
Easy to learn and simple for me	5	(4)	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ____ No

Why or why not? _____

6. If you could change anything about this program, what would it be? _____

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
I HAVE A BETTER UNDERSTANDING OF SOLVING AREAS & VOLUMES

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?

✓ Yes ____ No Why or why not? I AM SOLVING PROBLEMS FOR MYSELF

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	5	(4)	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	(4)	3	2	1	Totally useless to me outside work
Exactly what I expected	(5)	4	3	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	(5)	4	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? ✓ Yes ____ No

Why or why not? IT COULD HELP THEM SOLVE PROBLEMS FOR THEMSELF INSTEAD OF RELYING ON A ENGINEER.

6. If you could change anything about this program, what would it be? HAVE MORE CLASSES PER WEEK.

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

BEST COPY AVAILABLE

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
Find areas of Cylinders, Octagon's and other odd Shapes

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?

X Yes ____ No Why or why not? _____

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	4	(3)	2	1	Totally useless to me outside work
Exactly what I expected	5	4	(3)	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	5	(4)	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ____ No

Why or why not? _____

6. If you could change anything about this program, what would it be? _____

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

APPENDIX IV

MATERIALS: WORKSHEETS• HANDOUTS • FORMS

REVISED INSTRUCTOR MATERIALS

Carpenter's Training Center

Sample Materials

developed by Sandy Clawson, Marjorie Taylor,
Scott Copeland & Merry Jo Chatelain
for
Mt. Hood Community College/
Oregon Washington Carpenters Employers
Apprenticeship & Training Trust Fund

Name _____

Date _____

CARPENTRY MATH QUIZ

The following questions are designed to aid the student in a study of mathematics for carpenters. Students taking this quiz may use calculators, books, hand-out sheets and information from the instructor or other students to figure their answers. Good Luck!

1. Convert the following decimal feet to feet, inches, and the nearest 16th of an inch:

101.33' _____ 16.29' _____

198.60' _____ 256.77' _____

137.41' _____ 112.94' _____

2. Use a calculator to convert the following dimensions to decimal feet, rounded off to the nearest 100th:

3' 7 1/4" _____

28' 6 5/8" _____

6' 8 5/16" _____

112' 1 3/8" _____

75' 3 15/16" _____

3. How many board feet are in each of the following pieces of lumber?

8' X 2" X 4" _____

16' X 2" X 8" _____

12' X 1" X 6" _____

4' X 4" X 4" _____

18' X 4" X 14" _____

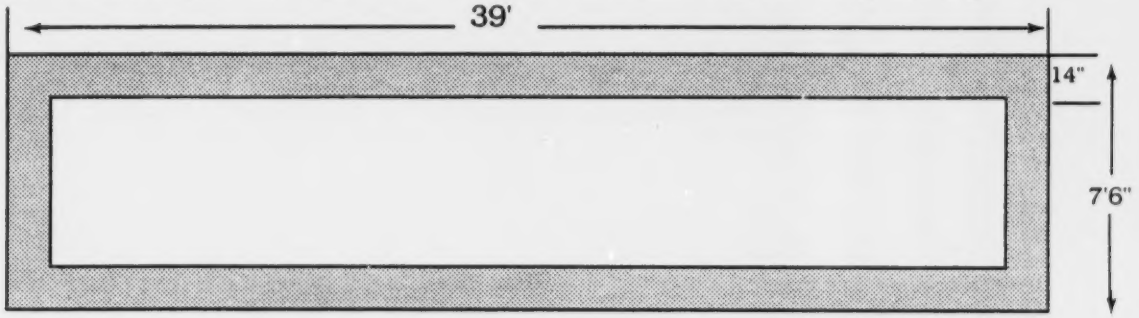
6' X 1" X 2" _____

4. A concrete wall is to be built 8" wide, 8' tall and 37' long. How many cubic yards will it take to pour it *(to the nearest 100th)* ? How many yards would you order?

Total cubic yards = _____

Concrete to order = _____

5. How much concrete will it take to pour the following 12" deep footing?



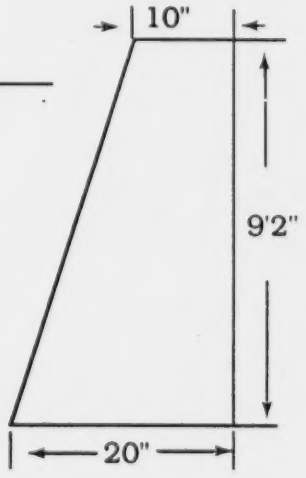
Total cubic yards *(nearest 100th)* = _____

Yards you would order = _____

6. How much concrete will it take for a 40' long retaining wall of the following dimensions?

Total cubic yards *(nearest 100th)* : _____

Yards you would order: _____



7. How much concrete will it take to pour 8 round columns, 14" in diameter and 13' 4" tall?

Total cubic yards *(nearest 100th)* :_____

Yards you would order: _____

Name _____

Date _____

CARPENTRY MATH QUIZ

The following questions are designed to aid the student in a study of mathematics for carpenters. Students taking this quiz may use calculators, books, hand-out sheets and information from the instructor or other students to figure their answers. Good Luck!

1. Convert the following decimal feet to feet, inches, and the nearest 16th of an inch:

101.33'	_____	16.29'	_____
198.60'	_____	256.77'	_____
137.41'	_____	112.94'	_____

2. Use a calculator to convert the following dimensions to decimal feet, rounded off to the nearest 100th:

3' 7 1/4"	_____
28' 6 5/8"	_____
6' 8 5/16"	_____
112' 1 3/8"	_____
75' 3 15/16"	_____

3. How many board feet are in each of the following pieces of lumber?

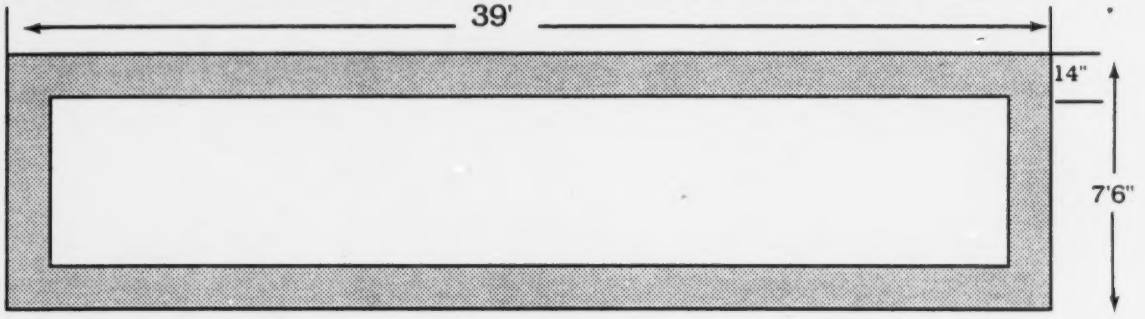
8' X 2" X 4"	_____
16' X 2" X 8"	_____
12' X 1" X 6"	_____
4' X 4" X 4"	_____
18' X 4" X 14"	_____
6' X 1" X 2"	_____

4. A concrete wall is to be built 8" wide, 8' tall and 37' long. How many cubic yards will it take to pour it *(to the nearest 100th)* ? How many yards would you order?

Total cubic yards = _____

Concrete to order = _____

5. How much concrete will it take to pour the following 12" deep footing?



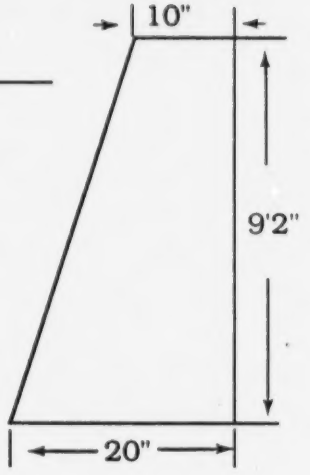
Total cubic yards *(nearest 100th)* = _____

Yards you would order = _____

6. How much concrete will it take for a 40' long retaining wall of the following dimensions?

Total cubic yards *(nearest 100th)* : _____

Yards you would order: _____



7. How much concrete will it take to pour 8 round columns, 14" in diameter and 13' 4" tall?

Total cubic yards *(nearest 100th)* : _____

Yards you would order: _____

NAME_____

DATE_____

JOB ENTRY TRAINING PRE-TEST - A

Solve the following, showing your work:

1. 1 1/4 - 7/8 =

2. 16 - 12 1/4 =

3. 14 3/4 x 1 1/16 x 32 =

4. 5 1/5 x 15/16 x 3 1/2 =

5. 1 1/4 ÷ 5/16 =

6. 14 x (2' 7") =

7. (20' 6") ÷ 12 =

8. 13 x (2'6") =

9. (83' 6") ÷ 6 =

10. 3 1/3 ÷ 5 =

NAME_____

DATE_____

FRACTION WORKSHEET

Solve the following, showing your work:

1. 1 1/4 - 7/8 =
2. 4 5/16 - 2 3/4 =
3. 3/4 x 2/3 =
4. 16 - 12 1/4 =
5. 15/16 x 3/5 =
6. 2 1/4 x 3 5/8 x 4 5/12 =
7. 14 3/4 x 1 1/16 x 32 =
8. 5 1/4 x 2 2/3 x 3 5/12 =
9. 1 2/3 x 3 1/4 x 12 =
10. 5 1/5 x 15/16 x 3 1/2 =
11. 2/3 ÷ 3/4 =
12. 5/16 ÷ 3/8 =
13. 1 1/4 ÷ 5/16 =
14. 5/16 ÷ 4 1/8 =
15. 16 ÷ 5 1/3 =
16. 14 x (2' 7") =
17. 18 x (3' 5") =
18. (8' 5 1/4") ÷ 15" =
19. (20' 6") ÷ 12 =
20. 29 x (4' 11") =

Perform the indicated operations:

21. 3 1/4 x (5' 3 1/2") =

22. 13 x (2'6") =

23. (50' 3 1/2") x 11 =

24. (2' 6 3/4") ÷ 8" =

25. (83' 6") ÷ 6 =

26. 11 x (3' 6") =

27. 2 1/4 ÷ 3 =

28. 3 1/3 ÷ 5 =

29. 7 1/7 ÷ 5/7 =

30. 30 ÷ 7 1/2 =

31. 3/4 ÷ 2 1/4 =

32. 3 1/3 x 5 =

33. 51/57 x 19/26 =

34. 24/35 x 5/6 =

35. 5/8 x 3/4 x 128 x 5/16 =

36. 1/2 x 3 1/3 x 9/16 =

37. Find the square root of 900 =

NAME _____

DATE _____

JOB ENTRY TRAINING WORKSHEET 2

Solve the following, showing your work:

1. 1 1/3 - 5/6 =
2. 5 3/16 - 3 1/4 =
3. 7/8 x 1/3 =
4. 15 - 11 3/4 =
5. 11/16 x 2/5 =
6. 3 3/4 x 2 3/8 x 4 7/12 =
7. 12 1/4 x 2 3/16 x 28 =
8. 3 3/4 x 2 1/3 x 3 7/12 =
9. 2 1/3 x 3 3/4 x 16 =
10. 4 3/5 x 11/16 x 7 1/2 =
11. 1/3 ÷ 1/4 =
12. 7/16 ÷ 5/8 =
13. 1 3/4 ÷ 9/16 =
14. 3/16 ÷ 4 3/8 =
15. 21 ÷ 2 1/3 =
16. 12 x (3' 4") =
17. 16 x (2' 9") =
18. (6' 3 3/4") ÷ 15" =
19. (10' 6") ÷ 12 =
20. 17 x (5' 9") =
21. 4 3/4 x (3' 2 1/2") =
22. 15 x (3' 6") =
23. (30' 5 1/2") x 7 =
24. (3' 5 1/4") ÷ 8" =
25. (75' 6") ÷ 3 =
26. 7 x (4' 6") =
27. 5 3/8 ÷ 2 =

JOB ENTRY TRAINING WORKSHEET 2

Solve the following, showing your work:

28. 2 1/3 ÷ 7 =

29. 8 1/8 ÷ 5/8 =

30. 20 ÷ 3 1/3 =

31. 2/3 ÷ 1 1/3 =

32. 4 1/3 x 5 =

33. 14/39 x 13/21 =

34. 14/45 x 5/7 =

35. 3/8 x 1/4 x 96 x 7/16 =

36. 1/2 x 2 1/3 x 9/16 =

37. Find the square root of 625 =

NAME _____

DATE _____

JOB ENTRY TRAINING POST-TEST - A

Solve the following, showing your work:

1. 1 1/3 - 5/6 =

2. 15 - 11 3/4 =

3. 12 1/4 x 2 3/16 x 28 =

4. 4 3/5 x 11/16 x 7 1/2 =

5. 1 3/4 ÷ 9/16 =

6. 12 x (3' 4") =

7. (10' 6") ÷ 12 =

8. 15 x (3' 6") =

9. (75' 6") ÷ 3 =

10. 2 1/3 ÷ 7 =

Name _____ Date _____

DECIMAL/FRACTION CONVERSION PRE-TEST

Change to the nearest 16th inch or thousandth of a foot (unless otherwise indicated)

1. 6' 7 3/4" = _____

2. 4.825' = _____

3. 47' 1/4" = _____

4. 13.281' = _____

5. 7' 2 5/16" = _____

Name _____ Date _____

DECIMAL/FRACTION CONVERSION POST-TEST

Change to the nearest 16th inch or thousandth of a foot (unless otherwise indicated.)

1. 8' 5 7/8" = _____

2. 5.775' = _____

3. 33' 6 3/4" = _____

4. 12.302' = _____

5. 14' 3 9/16" = _____

CALCULATOR CONVERSIONS OF DECIMALS/FRACTIONS USING FEET AND INCHES

Changing feet, inches and fractions to feet (in decimals), *sample: 5' 6 3/4":*

1. Change the fraction of an inch to a decimal.
   a. Enter the numerator (top number of the fraction)
   b. Enter "+"
   c. Enter denominator (bottom number of the fraction)
   d. Enter "="
   Example: 3 + 4 = .75

2. Add the whole inches:
   a. Enter " + "
   b. Enter the whole inch number
   c. Enter " = "
   Example: .75 "+ 6" = 6.75"

3. Divide by 12 (there are 12 inches to one foot)
   a. Enter " + "
   b. Enter " 12 "
   c. Enter " = "
   Example: 6.75" + 12 = .5625'

4. Add the whole feet
   a. Enter " + "
   b. Enter number of feet
   c. Enter " = "
   Example: .5625' + 5' = 5.5625'

Changing feet (in decimals) to feet, inches and fractions, *sample: 5.5625:*

1. Subtract out whole feet
   a. Write down whole feet (everything to the left of the decimal point)
   b. Enter " - "
   c. Enter the number of feet
   d. Enter " = "
   Example: 5.5625' - 5' = .5625'

2. Change decimal foot to inches
   a. Enter " x "
   b. Enter " 12 "
   c. Enter " = "
   Example: .5625' x 12 = 6.75

3. Subtract out whole inches
   a. Write down whole inches (everything to the left of the decimal point)
   b. Enter " - "
   c. Enter the number of inches
   d. Enter " = "
   Example: 6.75' - 6' = .75'

4. Change the decimal inch to a fraction
   a. Enter " x "
   b. Enter " 16 " (for reading to the nearest 16th)
   c. Enter " = "
   d. Round off the answer and use it as the numerator over a denominator of 16
   e. Reduce the fraction to 8ths, 4ths, or 2nds if possible
   Example: .75' x 16 = 12 ; 12/16" = 3/4"

NAME _____

DATE _____

DECIMAL, FRACTION CONVERSION WORKSHEET

Solve to nearest 16th inch, or thousandth of a foot (unless otherwise indicated).

1. 4' 8 3/4" = _____

2. 6.825' = _____

3. 38' 5 11/16" = _____

4. 23.929' = _____
(to nearest 32nd)

5. 14' 2 1/3" = _____

6. 17.324' = _____

7. 20' 11 2/3" = _____

8. 66.737' = _____
(to nearest 32nd)

9. 51' 8/32" = _____

10. 108.49' = _____

Skill Builders SC/MT 2/14/91

Name _____ Date _____

CONVERTING DEGREES PRE-TEST

1. Convert 72° 41' to decimal degrees _____

2. Change 63.7° to degrees, minutes and seconds _____

3. 16° 31' 12" is how much in decimal degrees? _____

4. Convert 35° 30' to decimal degrees _____

5. 56.2° is equal to 56° _____ minutes _____ seconds

Name _____ Date _____

CONVERTING DEGREES POST-TEST

Convert these to decimal degrees.

1. 45° 10' = _____

2. 88° 56' = _____

3. 75° 45' = _____

4. 22° 15' 55" = _____

5. 75° 10' 30" = _____

Convert these to degrees, minutes and seconds if needed.

1. 60.6° = _____

2. 35.75° = _____

3. 41.66° = _____

4. 56.02° = _____

5. 21.25° = _____

NAME _____

Converting Degrees, Minutes and Seconds to Decimal Degrees

When using the calculator, it is often easier to work with degrees if the minutes and seconds are changed to decimal degrees. This is easily done by first dividing the number of seconds by 60, adding the minutes to the decimal and again dividing by 60. ***Note:*** 60" = 1', 60' = 1°

Example: Change 35°30'25" to decimal degrees: 25 ÷ 60 = .417, 30.417 ÷ 60 = .5069; 35°30'25" = 35.5069°

Note: The whole number of degrees remains the same.

Converting Decimal Degrees to Degrees, Minutes and Seconds: Conversely, to change decimal degrees to degrees, minutes and seconds, multiply the decimal by 60. The whole number is the number of minutes. Subtract out the whole number (the minutes) and multiply the decimal by 60 again. Round off to the nearest whole number and this is the number of seconds.

Example: Convert 45.2131° to degrees, minutes and seconds: .2131 X 60 = 12.786' - 12' = .786 X 60 = 47.16"; 45.2131° = 45°12'47" (where 47.16 has been rounded to nearest whole number)

Convert the following degrees, minutes and seconds to decimal degrees. *Round off to four places.*

1. 75°15'45" = _____
2. 105°35'23" = _____
3. 90°23'59" = _____
4. 320°54'10" = _____

Change the decimal degrees to degrees, minutes and seconds. *Round off to nearest whole seconds.*

1. 195.33° = _____
2. 26.9089° = _____
3. 45.7515° = _____
4. 57.5556° = _____

Name _____

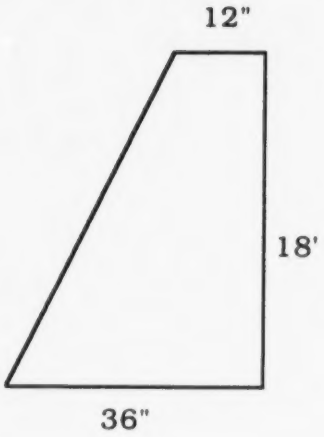
CONCRETE WALLS AND COLUMNS

How much concrete will it take for the retaining or foundation walls below?

1. 54' long

Total cu yds:

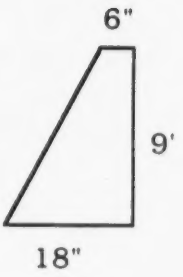
_____



2. 27' long

Total cu yds:

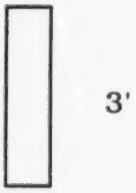
_____



3. 54' long

Total cu yds:

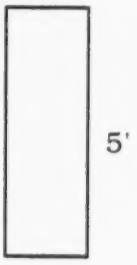
_____



4. 81' long

Total cu yds:

_____



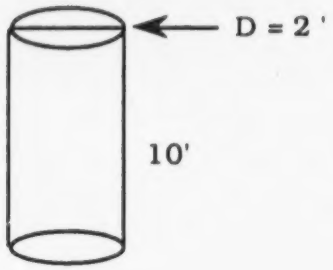
Skill Builders MT 3/10/92

How much concrete will it take to pour the following columns:

5. 4 columns

Total cu yds:

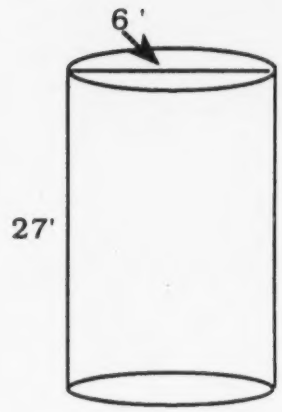
_____



6. 10 columns

Total cu yds:

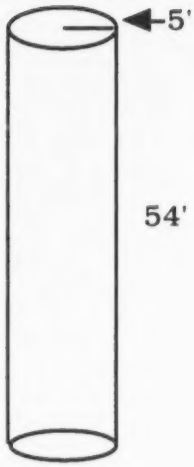
_____



7. 3 columns

Total cu yds:

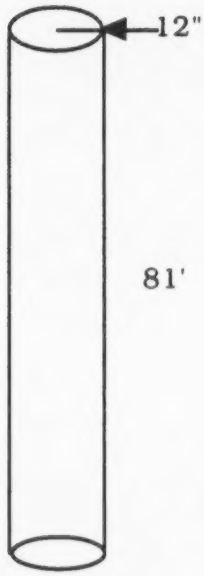
_____



8. 5 columns

Total cu yds:

_____



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RIGHT TRIANGLE PRE-TEST

Name_____ Date_____

1. How many degrees are in the three angles of a right triangle? _____

Solve the following.

2. $40° 50'$
$-20° 30'$

3. $\sqrt{49} =$ _____

4. $25^2 =$_____

5. Convert $25°35'$ to decimal degrees. _____

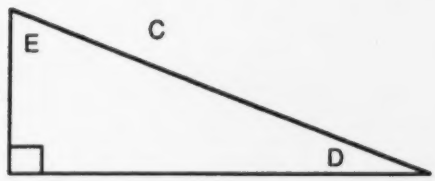
6. If the sides of a right triangle measure .300 and .400. What is the length of the hypotenuse? _____

RIGHT TRIANGLE POST TEST

Name _____ Date _____

Solve for missing angles and sides in these right triangles:

1.

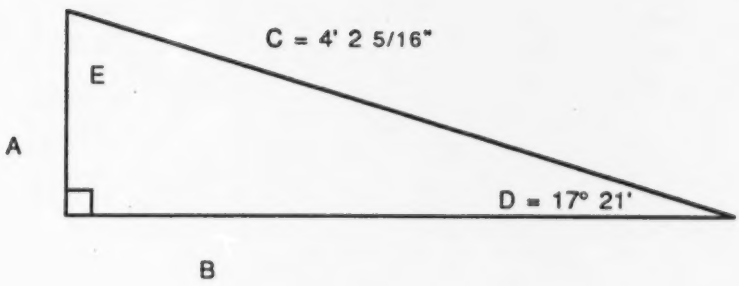


C =

D =

E =

2.

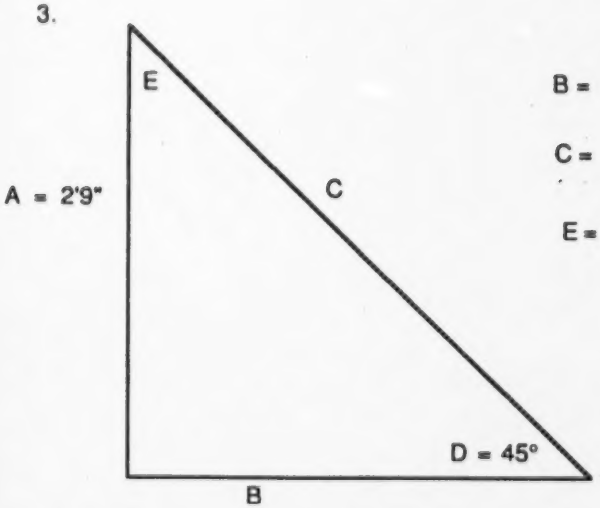


A =

B =

E =

3.



B =

C =

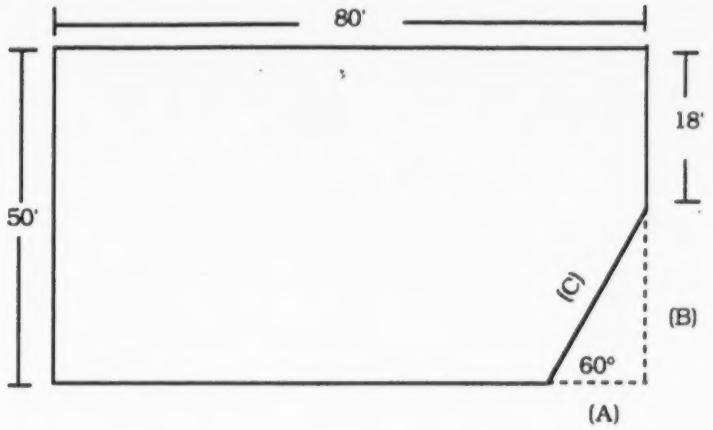
E =

RIGHT TRIANGLE MATH

1. How long is Line "B"?

2. How long is Line "A"?

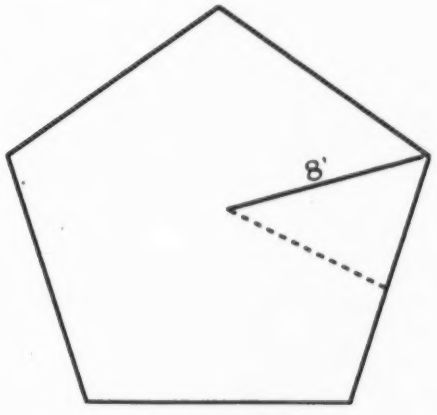
3. How long is Line "C"?



4. In a regular Pentagon, with a radius of 8':

   A. How long is the chord (from outside point to outside point)

   B. How far is it from the center of a chord to the center of the Pentagon (shown as dotted line)?



SOLVING FOR RIGHT TRIANGLES

Name_____ Date_____

Find the missing parts of the following right triangles.

1. D = 24°, A = 7". Find B, E, & C.

B = _____ E = _____ C = _____

2. A = 1' 3", E = 30° 40'. Find B, C, & D.

B = _____ C = _____ D = _____

3. D = 66° 20', C = 60.55 ft.. Find A, B, & E

A = _____ B = _____ E = _____

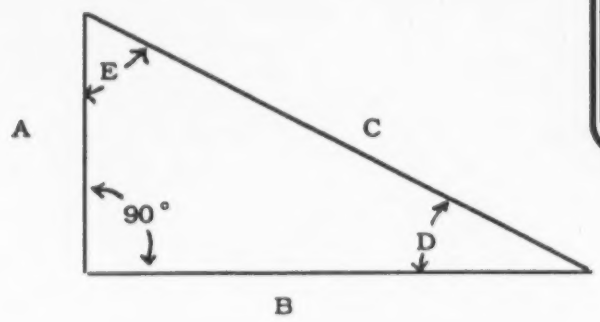
4. A = 34 ', B = 40 '. Find C, D, & E.

C = _____ D = _____ E = _____

5. B = 25' 6", C = 40 '. Find A, D, & E.

A = _____ D = _____ E = _____

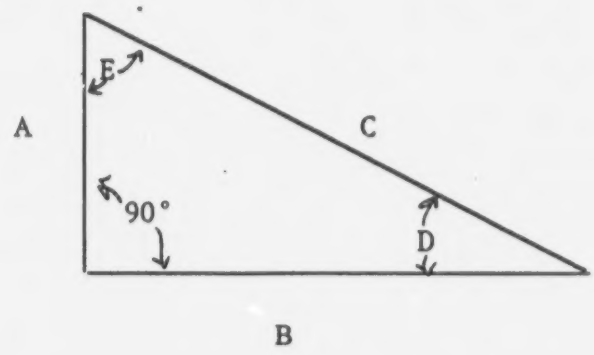
RIGHT TRIANGLES



SAMPLE:
A = 3
B = 4
C = 5
D = 36.87°
E = 53.13°

TO FIND	KNOWN PARTS	FORMULA	CALCULATOR APPLICATION (: = "ENTER") Casio
A	C & D	$C \times \text{SIN } D = A$	:C:x:D:SIN:=
A	B & D	$B \times \text{TAN } D = A$	:B:x:D:TAN:=
A	C & B	$\sqrt{C^2 - B^2} = A$	:C:INV:X²:—:B:INV:X²:=:√
B	C & D	$C \times \text{COS } D = B$	:C:x:D:COS:=
B	A & D	$\frac{A}{\text{TAN } D} = B$	:A:÷:D:TAN:=
B	C & A	$\sqrt{C^2 - A^2} = B$	:C:INV:X²:—:A:INV:X²:=:√
C	A & D	$\frac{A}{\text{SIN } D} = C$	:A:÷:D:SIN:=
C	B & D	$\frac{B}{\text{COS } D} = C$	:B:÷:D:COS:=
C	A & B	$\sqrt{A^2 + B^2} = C$	:A:INV:X²:+:B:INV:X²:=:√
D	A & C	$\frac{A}{C} = \text{SIN } D$	:A:÷:C:=:INV:SIN
D	B & C	$\frac{B}{C} = \text{COS } D$	:B:÷:C:=:INV:COS
D	A & B	$\frac{A}{B} = \text{TAN } D$	:A:÷:B:=:INV:TAN

RIGHT TRIANGLES



TO FIND	KNOWN PARTS	FORMULA	CALCULATOR APPLICATION (: = "ENTER") Texas Instrument - 34
A	C & D	C x SIN D = A	: C : x : D : SIN : =
A	B & D	B x TAN D = A	: B : x : D : TAN : =
A	C & B	$\sqrt{C^2 - B^2} = A$	: C : X^2 : — : B : X^2 : = : 2nd : $\sqrt{X}$
B	C & D	C x COS D = B	: C : x : D : COS : =
B	A & D	$\frac{A}{\text{TAN D}} = B$	: A : ÷ : D : TAN : =
B	C & A	$\sqrt{C^2 - A^2} = B$	: C : X^2 : — : A : X^2 : = : 2nd : $\sqrt{X}$
C	A & D	$\frac{A}{\text{SIN D}} = C$	: A : ÷ : D : SIN : =
C	B & D	$\frac{B}{\text{COS D}} = C$	: B : ÷ : D : COS : =
C	A & B	$\sqrt{A^2 + B^2} = C$	: A : X^2 : + : B : X^2 : = : 2nd : $\sqrt{X}$
D	A & C	$\frac{A}{C} = \text{SIN D}$	: A : ÷ : C : = : 2nd : SIN
D	B & C	$\frac{B}{C} = \text{COS D}$	: B : ÷ : C : = : 2nd : COS
D	A & B	$\frac{A}{B} = \text{TAN D}$	: A : ÷ : B : = : 2nd : TAN

NAME _____

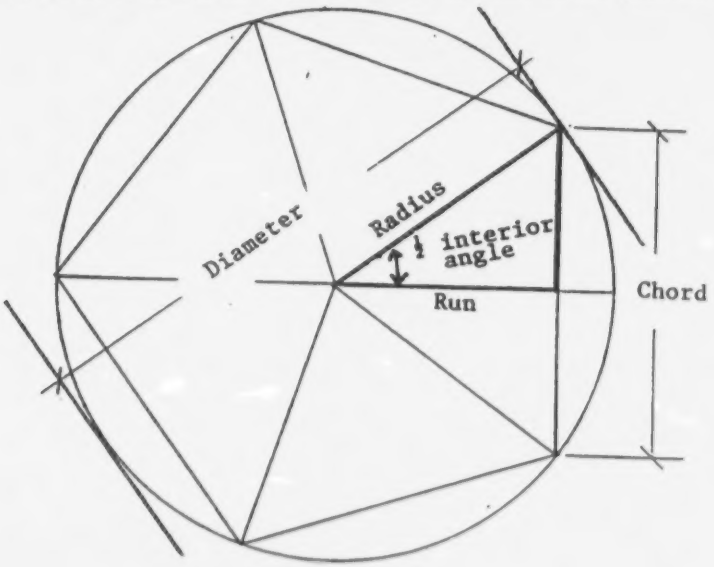
DATE _____

GAZEBO MATHEMATICS

(any number of sides)

The following is a step-by-step information sheet on the mathematics involved in figuring a gazebo of any size, number of sides and any roof slope. By practicing the mathematics involved in gazebos, students will learn principles and methods for figuring other carpentry problems such as bolt template layouts, stair slope angles, squaring building lines, and bay window mathematics.

Three "givens" will have to be established to start this exercise: (1) the number of sides of the gazebo; (2) the roof slope and (3) the diameter.



Fill in all answers as soon as they are figured. Fill in "givens" first.

Given: Number of sides: _____
Given: Roof slope: _____
Given: Diameter: _____
A. Radius (hip run): _____
B. 1. Interior angle: _____
2. 1/2 Interior angle: _____
C. 1. Span: _____
2. Run: _____
D. Chord length: _____
E. Length of common rafter per foot of run: _____
F. Theoretical length of common rafter: _____
G. Height of roof: _____
H. Theoretical length of hip rafter: _____
I. Hip rafter cut: _____

A. To figure radius:
Radius = 1/2 diameter

B. To figure interior angle:

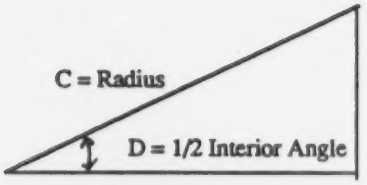
1. 360° + number of sides = interior angle

2. Interior angle + 2 = 1/2 interior angle

C. To figure span and run:

1. Hip run = radius (1/2 diameter)

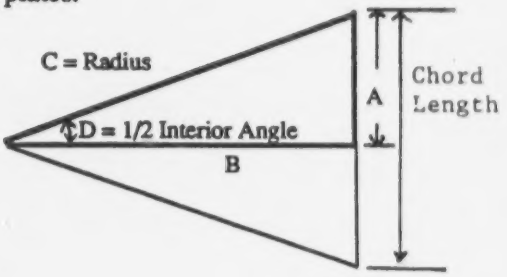
2. Run (of common rafter) = B
1/2 interior angle = D
Radius = C
B = cos D x C (: D : cos : x : C : =)



3. Span = 2 x run

D. To figure chord length (length long point to long point of exterior wall plates.

1. Run = B
1/2 interior angle = D



2. A = sin D x C (: D : sin : x : C : =)

3. A x 2 = chord length

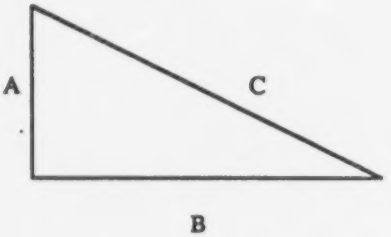
4. The angle to cut the plates is the same as "1/2 interior angle".

E. To figure length of common rafter per foot of run:

1. Length per foot of run can be found on the framing square

OR

2. A = rise per foot (from roof slope given)
B = 12" (from roof slope given)
$C = \sqrt{A^2 + B^2}$ (: A : X^2 : + : 12 : X^2 : = : $\sqrt{X}$)

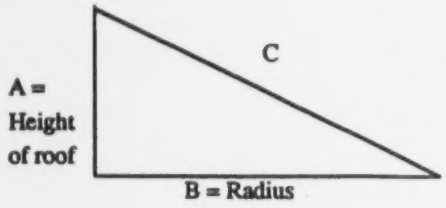


F. To figure theoretical length of common rafter :

1. run x length per foot of run (÷ 12 to read answer in feet)

G. To figure height of roof:

1. A = total theoretical height of roof
   (common run x rise per foot from slope given)



H. To figure theoretical length of hip rafter:

B = radius (hip run)
C = theoretical length of hip rafter
$C = \sqrt{A^2 + B^2}$
(: A : X^2: + : B : X^2: = : $\sqrt{X}$)

I. To figure hip rafter cut:

1. The "rise" will be the same as the "rise" per foot of run for a common rafter.
2. The unit of hip run can be solved by:

$$\text{Unit hip run (inches)} = \frac{\text{Radius (in inches)}}{\text{Height of roof (in inches)}} \times \text{unit rise (given in inches)}$$

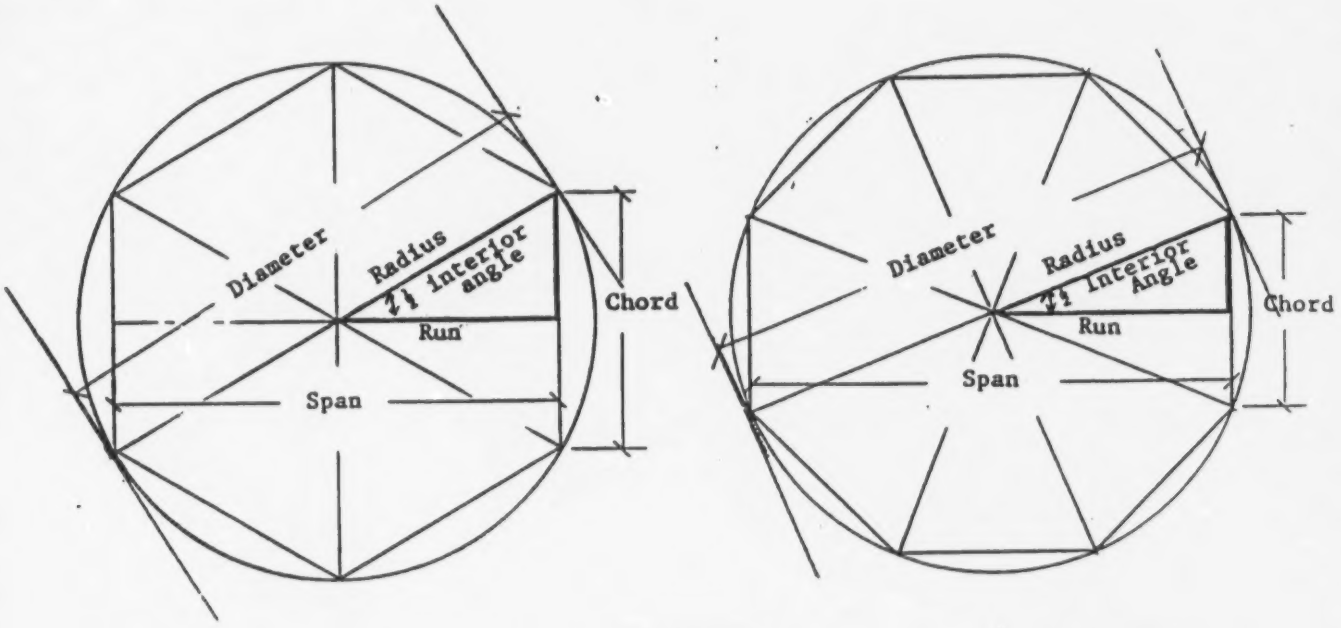
Note: The rafter lengths are theoretical. When laying-out rafters, subtract the ridge and add the overhang.

NAME _____

DATE _____

HEXAGON AND OCTAGON GAZEBO MATHEMATICS

Two "givens" will have to be established to start this exercise: (1) the roof slope and (2) the span (distance across from side to side).



Fill in all answers as soon as they are figured. Fill in "givens" first.

		HEXAGON	OCTAGON
Given:	Number of sides:	6	8
Given:	Roof slope (cut of common rafter):		
Given:	Span:		
A.	Run:		
B.			
1.	Interior angle:		
2.	1/2 Interior angle:		
C.			
1.	Radius (hip run):		
2.	Diameter:		
D.	Chord length (same as radius for hexagon only):		
E.	Length of common rafter per foot of run:		
F.	Theoretical length of common rafter:		
G.	Height of roof:		
H.	Theoretical length of hip rafter:		
I.	Hip rafter cut:	59	

A. To figure the run:
Run = 1/2 span

B. To figure interior angle:

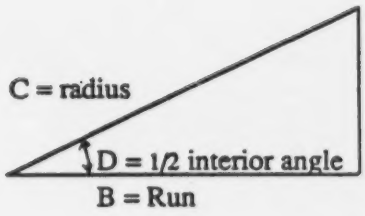
1. 360° ÷ number of sides = interior angle

2. Interior angle ÷ 2 = 1/2 interior angle

C. To figure radius/diameter:

1. $C = \frac{B}{\text{Cos } D}$

(: B : ÷ : D : cos : =) (: = Enter)

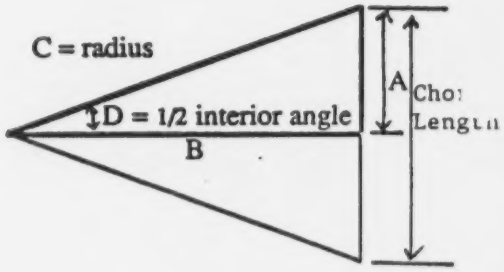


2. Radius x 2 = Diameter

D. To figure chord length for octagon (length long point to long point of exterior wall plates.

1. Run = B
1/2 interior angle = D

2. a) A = sin D x C (when radius is known)
(: D : sin : x : C : =)
OR
b) A = B x tan D (when run is known)
(: B : x : D : tan : =)



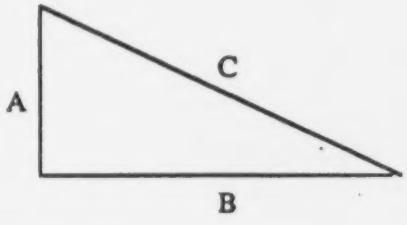
3. A x 2 = chord length

4. The angle to cut the plates is the same as "1/2 interior angle".

E. To figure length of common rafter per foot of run:

1. Length per foot of run can be found on the framing square.
OR

2. A = rise per foot (from roof slope given)
B = 12" (from roof slope given)
$C = \sqrt{A^2 + B^2}$ (: A : X^2 : + : 12 : X^2 : = : $\sqrt{X}$)
C = Length per foot of run



To figure theoretical length of common rafter:

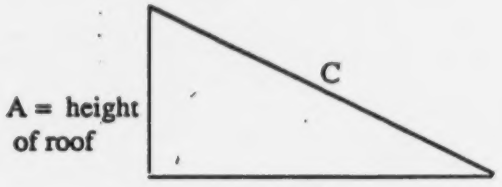
1. run x length per foot of run (÷ 12 to read answer in feet)

G. To figure height of roof:

1. A = total theoretical height of roof (common run x rise per foot from slope given)

H. To figure theoretical length of hip rafter:

B = radius (hip run)
C = theoretical length of hip rafter
$C = \sqrt{A^2 + B^2}$
(: A : X^2 : + : B : X^2 : = : + = $\sqrt{X}$)



I. To figure hip rafter cut:

1. The "rise" will be the same as the "rise" per foot of run for a common rafter.
2. The unit of hip run can be solved by:

$$\text{Unit hip run (inches)} = \frac{\text{Radius (in inches)}}{\text{Height of roof (in inches)}} \times \text{unit rise (given in inches)}$$

Note: The rafter lengths are theoretical. When laying-out rafters, subtract the ridge and add the overhang.

APPENDIX V

SOURCE MATERIALS

SOURCE MATERIALS

Apprenticeship and Training Department, United Brotherhood of Carpenters and Joiners of America. Millwright: Unit II - Mathematics and Workbook, Washington, D.C., 1975.

Apprenticeship and Training Department, United Brotherhood of Carpenters and Joiners of America. Carpentry: Mathematics for Carpentry, Washington, D.C., 1976.

Apprenticeship and Training Department, United Brotherhood of Carpenters and Joiners of America. Carpentry: Basic Mathematics, Washington, D.C., 1975.

Brown, Walter C. Blueprint Reading for Construction, Goodheart-Willcox Company, Inc., West Holland, Illinois, 1989.

Charnhas, Mary S. and others. Essential Mathematics for Life, Lifelong Learning Division, Scott Foresman and Company, Glenview, Illinois, 1989.

Mt. Hood Community College, GED Mathematics Skill Book.

Carpenter's Training Center

Final Papers for Grant

Submitted by Marjorie A. Taylor & Sandy Clawson
for
Mt. Hood Community College
March 23, 1992

Carpenter's Training Center

Contents

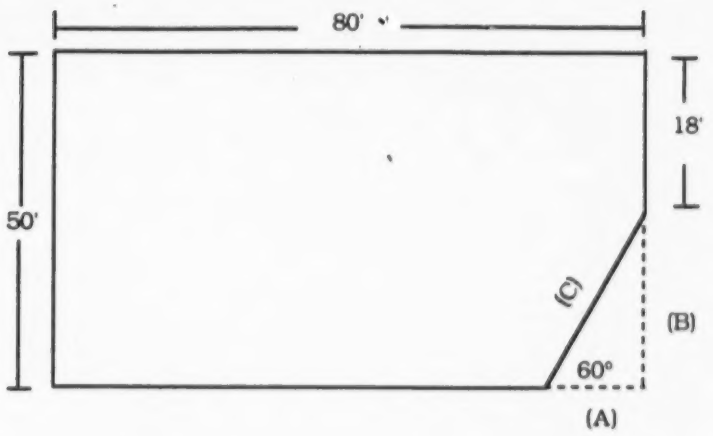
- New Materials Developed
- Staff Report of Participants' Feedback – None.
- Participants' Feedback

RIGHT TRIANGLE MATH

1. How long is Line "B"?

2. How long is Line "A"?

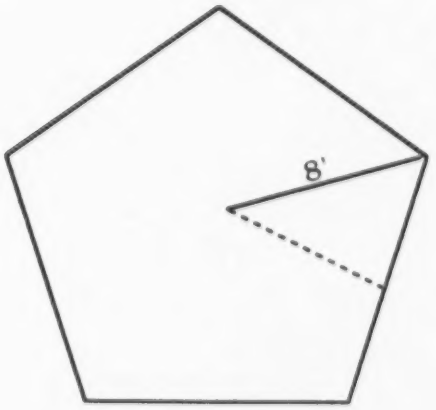
3. How long is Line "C"?



4. In a regular Pentagon, with a radius of 8':

   A. How long is the chord (from outside point to outside point)

   B. How far is it from the center of a chord to the center of the Pentagon (shown as dotted line)?



Name _____

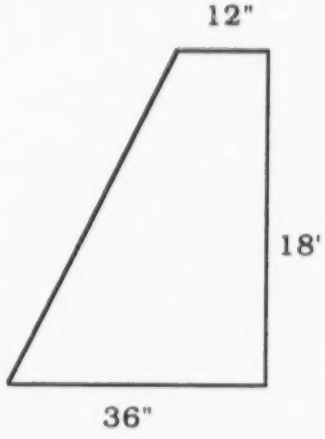
CONCRETE WALLS AND COLUMNS

How much concrete will it take for the retaining or foundation walls below?

1. 54' long

Total cu yds:

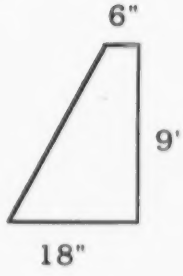
_____



2. 27' long

Total cu yds:

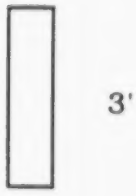
_____



3. 54' long

Total cu yds:

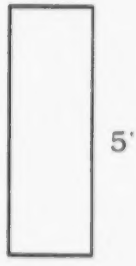
_____



4. 81'' long

Total cu yds:

_____



Skill Builders MT 3/10/92

Name _____

Date _____

CARPENTRY MATH QUIZ

The following questions are designed to aid the student in a study of mathematics for carpenters. Students taking this quiz may use calculators, books, hand-out sheets and information from the instructor or other students to figure their answers. Good Luck!

1. Convert the following decimal feet to feet, inches, and the nearest 16th of an inch:

101.33' _____	16.29' _____
198.60' _____	256.77' _____
137.41' _____	112.94' _____

2. Use a calculator to convert the following dimensions to decimal feet, rounded off to the nearest 100th:

3' 7 1/4" _____

28' 6 5/8" _____

6' 8 5/16" _____

112' 1 3/8" _____

75' 3 15/16" _____

3. How many board feet are in each of the following pieces of lumber?

8' X 2" X 4" _____

16' X 2" X 8" _____

12' X 1" X 6" _____

4' X 4" X 4" _____

18' X 4" X 14" _____

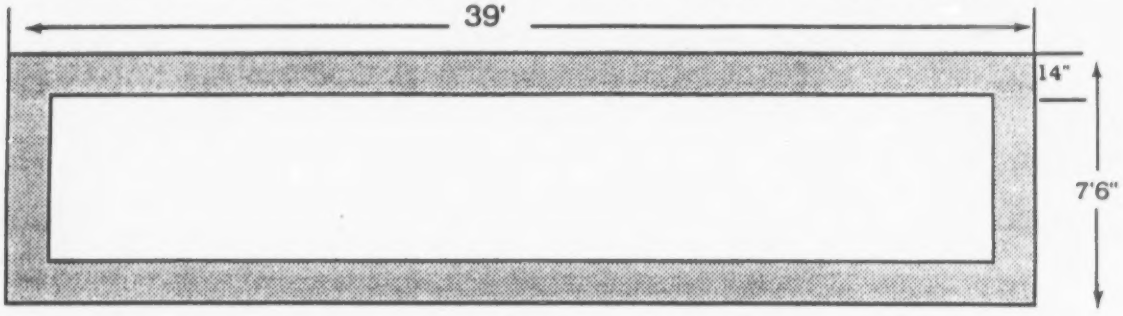
6' X 1" X 2" _____

4. A concrete wall is to be built 8" wide, 8' tall and 37' long. How many cubic yards will it take to pour it *(to the nearest 100th)* ? How many yards would you order?

Total cubic yards = _____

Concrete to order = _____

5. How much concrete will it take to pour the following 12" deep footing?



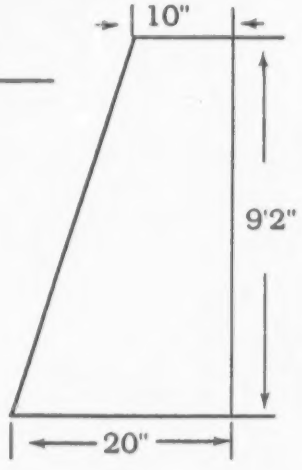
Total cubic yards *(nearest 100th)* = _____

Yards you would order = _____

6. How much concrete will it take for a 40' long retaining wall of the following dimensions?

Total cubic yards *(nearest 100th)* : _____

Yards you would order: _____



7. How much concrete will it take to pour 8 round columns, 14" in diameter and 13' 4" tall?

Total cubic yards *(nearest 100th)* : _____

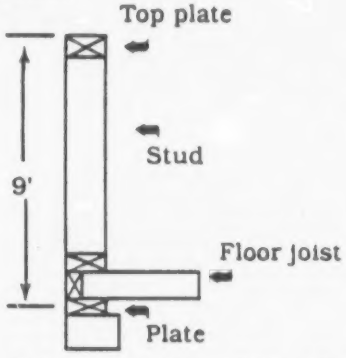
Yards you would order: _____

8. How many sheets of 4' X 8' plywood would you order to cover a floor area 38' wide by 42' long?

Number of sheets: _____

9. How many sheets of 4' X 8' plywood would you order for the exterior walls of a house 38' wide by 42' long with a sectional view as follows:

Number of sheets: _____



10. Figure the theoretical length for a common rafter on a 5:12 slope for a 34' wide house with a gable roof:

Decimal theoretical length to nearest 100th: _____

Theoretical length in feet, inches and nearest 16th: _____

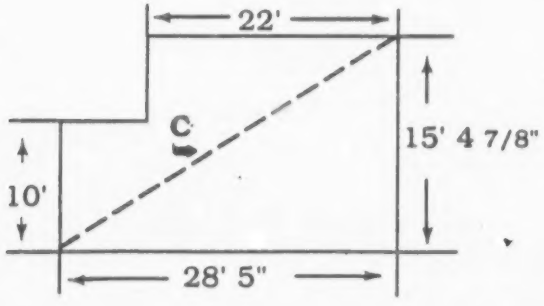
Decimal theoretical total length with a 2' overhang: _____

Theoretical total length with a 2' overhang in feet and inches: _____

11. What is the diagonal measurement ("C") in the following drawing:

Decimal to nearest 100th: _____

Feet, inches and nearest 16th: _____



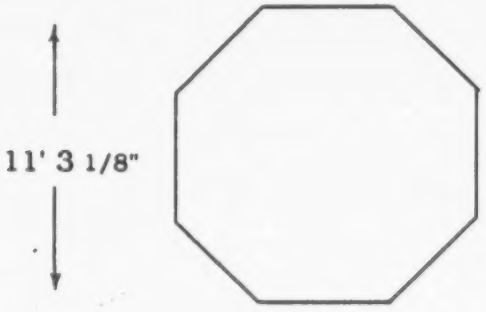
12. What angle would a set of stairs be if each riser was 7 5/16" and each tread was 10 11/16"?

Angle = _____ degrees _____ minutes _____ seconds

13. How long is each side of the octagon below?

Decimal to nearest 100th: _____

Feet, inches and nearest 16th: _____



14. How long is each side of a hexagon *(6 sides)* that has a diameter of 12' ?

Length = _____

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?

All Fractions

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?

X Yes ___ No Why or why not? I understand much more

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	(4)	3	2	1	Totally useless to me outside work
Exactly what I expected	(5)	4	3	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	5	(4)	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ___ No

Why or why not? If anyone I new was having difficulty I would say for sure this would help

6. If you could change anything about this program, what would it be? Nothing

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

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CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
Some fractions

2. How many classes have you attended so far? this one Classes

3. Has this class helped you meet or work toward any of your personal goals?

X Yes ____ No Why or why not? ____

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program?						
Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	(5)	4	3	2	1	Totally useless to me outside work
Exactly what I expected	(5)	4	3	2	1	Not at all what I expected
How would you rate the materials?						
Easy to learn and simple for me	(5)	4	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ____ No

Why or why not? ____

6. If you could change anything about this program, what would it be? Zones
Evenings

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
CHANGE FRACTION TO Decimals AND Dec. TO FRACTIONS IN FEET AND INCHES

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?
X Yes ____ No Why or why not? TO UNDERSTAND MATHEMATICS AT WORK.

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	5	4	(3)	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	(4)	3	2	1	Totally useless to me outside work
Exactly what I expected	5	4	(3)	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	(5)	4	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ____ No
Why or why not? EASY TO UNDERSTAND WITH Short Cuts Let.

6. If you could change anything about this program, what would it be? Less people in class, more time needed with individuals, less noise and more table space is necessary.

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
Under stand Triangle and Tangent

2. How many classes have you attended so far? 1 Classes

3. Has this class helped you meet or work toward any of your personal goals?
✓ Yes ___ No Why or why not? gave me better under standing on Math

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program?						
Very interesting to me	5	(4)	3	2	1	Boring to me
Very useful to me on the job	5	4	(3)	2	1	Totally useless to me on the job
Very useful to me outside work	5	4	(3)	2	1	Totally useless to me outside work
Exactly what I expected	5	4	(3)	2	1	Not at all what I expected
How would you rate the materials?						
Easy to learn and simple for me	5	(4)	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? ✓ Yes ___ No
Why or why not? It is fun and makes you feel better or smarter

6. If you could change anything about this program, what would it be? ___

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
Understand Math Better

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?

✓ Yes ____ No Why or why not? Math Counts alot in Carpentry

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	4	3	2	1	Totally useless to me outside work
Exactly what I expected	5	4	3	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	5	4	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? ✓ Yes ____ No

Why or why not? _____

6. If you could change anything about this program, what would it be? _____

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?

✓ Yes ___ No Why or why not? understand math formulas

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	(5)	4	3	2	1	Totally useless to me outside work
Exactly what I expected	5	4	(3)	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	(5)	4	3	2	1	Hard to learn and confusing for me

with tutor

5. Would you recommend this course to a co-worker or friend? ✓ Yes ___ No

Why or why not? to improve profits

6. If you could change anything about this program, what would it be? slower pace

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
Better understanding of math. 22 years out of School, old math at that.

2. How many classes have you attended so far? 1 Classes

3. Has this class helped you meet or work toward any of your personal goals?

✓ Yes ____ No Why or why not? _____

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	(5)	4	3	2	1	Totally useless to me outside work
Exactly what I expected	5	4	(3)	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	5	4	(3)	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? ✓ Yes ____ No

Why or why not? _____

6. If you could change anything about this program, what would it be? additional Time Reduced allowance

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?

_____

_____

_____

2. How many classes have you attended so far? ___1___ Classes

3. Has this class helped you meet or work toward any of your personal goals?

___✓___ Yes ____ No Why or why not? _____

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	(4)	3	2	1	Totally useless to me outside work
Exactly what I expected	(5)	4	3	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	5	4	3	2	1	Hard to learn and confusing for me ✓

5. Would you recommend this course to a co-worker or friend? ___✓___ Yes ____ No

Why or why not? _____

_____

6. If you could change anything about this program, what would it be? _____

_____

_____

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?

I can do math now

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?

✓ Yes ___ No Why or why not? ___

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program?						
Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	(5)	4	3	2	1	Totally useless to me outside work
Exactly what I expected	(5)	4	3	2	1	Not at all what I expected
How would you rate the materials?						
Easy to learn and simple for me	5	(4)	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? ✓ Yes ___ No

Why or why not? ___

6. If you could change anything about this program, what would it be? nothing

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?

More than I know before I got here. Thank you

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?

X Yes ____ No Why or why not? ____

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	(5)	4	3	2	1	Totally useless to me outside work
Exactly what I expected	5	4	(3)	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	5	4	3	(2)	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ____ No

Why or why not? ____

6. If you could change anything about this program, what would it be? ____

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
Fractions, Degrees, decimals into fractions

2. How many classes have you attended so far? 1 Classes

3. Has this class helped you meet or work toward any of your personal goals?
X Yes ____ No Why or why not? I needed to learn and the Lon! really helped

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	4	(3)	2	1	Totally useless to me outside work
Exactly what I expected	5	4	3	(2)	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	5	4	3	(2)	1	Hard to learn and confusing for me

But with the extra help it makes it easer to understand

5. Would you recommend this course to a co-worker or friend? X Yes ____ No
Why or why not? Very interesting

6. If you could change anything about this program, what would it be? Probably more tutoring

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?

know lots mores

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?

X Yes ____ No Why or why not? _____

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program?						
Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	(5)	4	3	2	1	Totally useless to me outside work
Exactly what I expected	(5)	4	3	2	1	Not at all what I expected
How would you rate the materials?						
Easy to learn and simple for me	(5)	4	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ____ No

Why or why not? _____

6. If you could change anything about this program, what would it be? more time

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
I can substract fractions properly; convert Degrees, Minutes, Seconds to decimals & decimals to degrees, Minutes & Seconds; Adding & substracting Degrees, Minutes & Seconds; Converting fractions to Dec. equivs & Dec. to fractions

2. How many classes have you attended so far? 1 Classes

3. Has this class helped you meet or work toward any of your personal goals?
✓ Yes ___ No Why or why not? Get a basic understanding in math for practical use

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program?						
Very interesting to me	5	4	(3)	2	1	Boring to me
Very useful to me on the job	5	(4)	(3)	2	1	Totally useless to me on the job
Very useful to me outside work	5	4	(3)	2	1	Totally useless to me outside work
Exactly what I expected	5	4	(3)	2	1	Not at all what I expected
How would you rate the materials?						
Easy to learn and simple for me	5	4	(3)	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? ✓ Yes ___ No
Why or why not? To brush up on practical math skills

6. If you could change anything about this program, what would it be? Nothing.

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
I improved Basic Math skills really enjoyed practicing, asking questions, and good attitude of teacher

2. How many classes have you attended so far? 2 Classes

3. Has this class helped you meet or work toward any of your personal goals?
✓ Yes ___ No Why or why not? Carpenter always uses math

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	(5)	4	3	2	1	Totally useless to me outside work
Exactly what I expected	(5)	4	3	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	(5)	4	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? ✓ Yes ___ No
Why or why not? According to each individual what they want out of it It's great

6. If you could change anything about this program, what would it be? No smoking in the Building.

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?

2. How many classes have you attended so far? 1 Classes

3. Has this class helped you meet or work toward any of your personal goals?

✓ Yes ___ No Why or why not? major help in math

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	(5)	4	3	2	1	Totally useless to me outside work
Exactly what I expected	5	4	3	2	(1)	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me Teacher & tutor made it easy	5	4	3	(2)	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? ✓ Yes ___ No

Why or why not? ___

6. If you could change anything about this program, what would it be? Longer

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?
Survey, Blueprint,

2. How many classes have you attended so far? 4 Classes

3. Has this class helped you meet or work toward any of your personal goals?
X Yes ___ No Why or why not? have more knowledge of work

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	(5)	4	3	2	1	Boring to me
Very useful to me on the job	(5)	4	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	(4)	3	2	1	Totally useless to me outside work
Exactly what I expected	5	4	3	2	(1)	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	5	4	(3)	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ___ No
Why or why not? Useful for career and personal Use.

6. If you could change anything about this program, what would it be? ___

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.

Skill Builders SC/MT 10/14/91

CARPENTER TRAINING CENTER
Monday-Wednesday Math Lab

POST-PROGRAM PARTICIPANT
Survey Sheet

Class Information:

1. What can you do now that you couldn't do before taking this class?

Figure problems out on calculator
ie - decimals, fractions
sine - cosine.

2. How many classes have you attended so far? 1 Classes

3. Has this class helped you meet or work toward any of your personal goals?

X Yes ____ No Why or why not? ____

4. Circle one number in each row across to show how you would rate each item.

How would you rate this program? Very interesting to me	5	(4)	3	2	1	Boring to me
Very useful to me on the job	5	(4)	3	2	1	Totally useless to me on the job
Very useful to me outside work	5	4	(3)	2	1	Totally useless to me outside work
Exactly what I expected	5	(4)	3	2	1	Not at all what I expected
How would you rate the materials? Easy to learn and simple for me	5	(4)	3	2	1	Hard to learn and confusing for me

5. Would you recommend this course to a co-worker or friend? X Yes ____ No

Why or why not? ____

6. If you could change anything about this program, what would it be? I like the program. Everyone was helpful and fun to work with

Thank you for taking time to help evaluate this course. Your answers will be very useful in trying to make it better.